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(54) **Method for producing an improved layer, particular for a drill bit.**

(57) Process for producing an article, e.g. a drill bit, wherein a first layer (4) of powder material is applied to a core member (3) by cold isostatic compacting and subsequent sintering, and a second, exterior layer (5) is then applied by thermal spraying followed by hot isostatic compacting. The powder material of the first layer (4) may be a nickel-containing alloy steel powder.

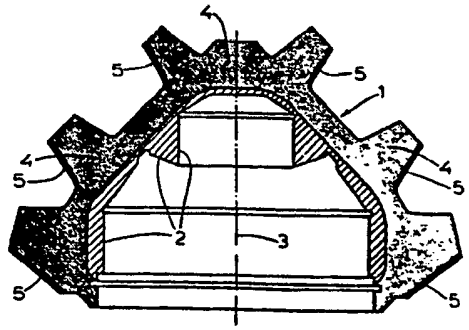

fig.1

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Claims

1. Method for producing an object on which an exterior layer is applied by thermal spraying, followed by a heat treatment, characterized in that on a core member (3) is applied, by cold isostatic compacting, a layer (4) of a suitable powder material, followed by sintering, after which the exterior layer (5), which is a wear-resistant layer, is applied and the structure thus obtained is then isostatically compacted hot.

2. Method according to claim 1, characterized in that the powder material of layer (4) is a nickel-containing alloy steel powder.

3. Method according to claim 2, characterized in that the steel powder contains 3.5% nickel.

4. Method according to claims 1-3, characterized in that after sintering of the powder material the wear-resistant layer (5) is sprayed only on the surfaces which in operation are directly subject to wearing action.

5. Method according to claims 1-4, characterized in that the core member (3) consists of a bearing material.

6. Object obtained according to the method of claims 1-5.

7. Drill bit with cutting teeth provided with a wear-resistant layer for drilling in rock, characterized in that on a core member (3) functioning as bearing is applied a layer (4) obtained by cold isostatic compacting and sintering of a suitable powder material, the cutting teeth of which are provided with the wear-resistant layer (5) on the places where the teeth in operation come into direct contact with the rock and the preformed drill bit is isostatically compacted hot in its entirety, such that a bond is established between the layers (4) and (5), on the one hand, and between the layer (4) and core member (3), on the other.

8. Drill bit according to claim 7, characterized in that the layer (4) consists of a nickel-containing alloy steel.

from the mold is then sintered in a furnace. After cooling the sintered object is coated with a wear-resistant layer by thermal spraying, for example plasma spraying, after which the structure thus obtained is isostatically compacted hot. This hot isostatic compacting may be done by inserting the entire object in a thin-walled deep-drawn vessel or container of low-carbon steel having a wall thickness of approximately 0.5 mm, filled with a ceramic powder. This vessel is then heated and placed under pressure on all sides. After hot isostatic compacting the object may be readily separated from the surrounding ceramic mass and cleaned by sand blasting. This method proves to procure components with accurately shaped dimensions comparable to those of a forged product.

When a drill bit for rock is produced in this fashion, after sintering not the entire surface of the cutting teeth but only the parts thereof which come directly into contact with the rock are coated with the wear-resistant layer by thermal spraying. Following the selective application of the wear-resistant layer the preformed drill bit is subjected in its entirety to hot isostatic compacting, as described above.

The invention is now explained in greater detail by means of the accompanying drawing, which represents a preferred embodiment of the invention.

Fig. 1 is a cross section of a drill bit produced according to the invention.

Fig. 2 is a perspective view of a portion of this drill bit.

The drill bit 1 shown in Fig. 1 is composed of a core member 3 , made of a bearing material, in which are applied the races 2 for the folling elements(not shown). On this core member 3, solid at the beginning, is applied, in a rubber mold, a layer 4 of powder, which combination is isostatically compacted cold. This operation takes place preferably under a pressure of approximately 6000 atmospheres at room temperature. Then the preformed drill bit, isostatically compacted cold, is removed from the mold and sintered in a sintering furnace at a temperature of approx. 1200°C

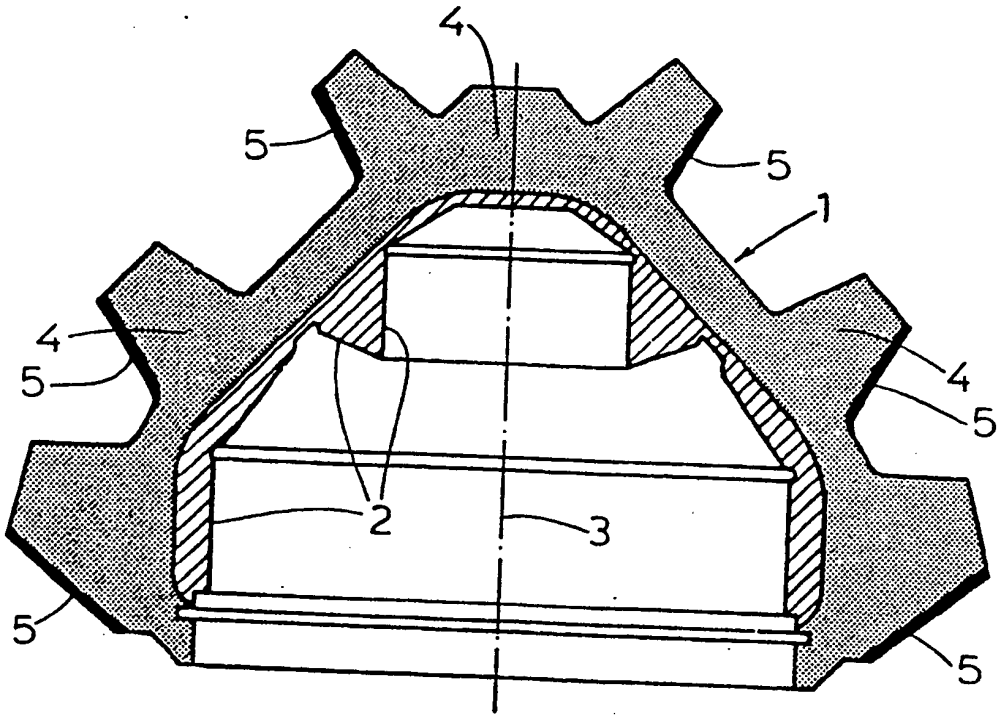

fig.1

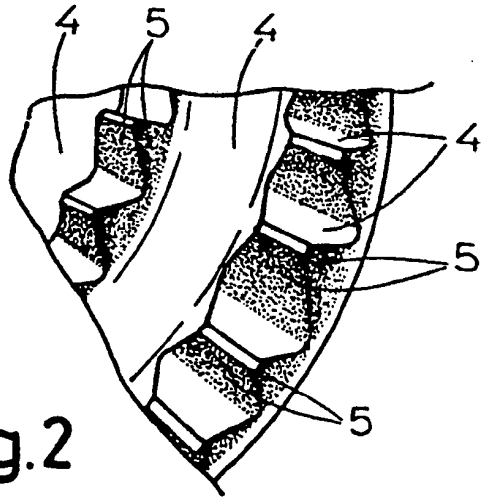

fig.2